

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A hollow fiber membrane type fluid treatment device for treating blood, the fluid treatment device comprising:

a housing body portion of a tubular housing containing a single hollow fiber membrane bundle;

a first housing head portion which is connected with one end of the housing body portion and has a resin layer where the hollow fiber membrane bundle is fixed by using a resin composition, and a first connection port which serves as a treatment liquid inlet;

a second housing head portion which is connected with a second end of the housing body portion and has a resin layer where the hollow fiber membrane bundle is fixed by using a resin composition, and a second connection port which serves as a treatment liquid outlet;

first and second header caps attached to the first and second housing head portions, respectively, and the first and second header caps having respective treatment target liquid connection ports; and

an inner surface of the housing body portion comprises a body straight portion in a center of the housing body portion and an end tapered portion provided at opposing ends of the housing body portion, the end tapered portion increasing in diameter toward an end face of the housing body portion, and [[the]] hollow fiber membranes of the hollow fiber membrane bundle

are arranged so that a distance between [[the]] individual hollow fiber membranes is gradually increased toward the end face of the housing body portion as the hollow fiber membranes extend along a taper of the end tapered portion, thereby increasing the diameter of the hollow fiber membrane bundle,

opening ends of the hollow fiber membrane bundle being fixed to an inside of the tubular housing by the resin layers, and the opening ends of the hollow fiber membrane bundle facing the respective treatment target liquid connection ports such that blood flows within the hollow fiber membranes,

the treatment liquid inlet and treatment liquid outlet being provided at a circumference of the hollow fiber membrane bundle such that a treatment liquid flows outside of the hollow fiber membranes, the hollow fiber membrane bundle configured to allow waste in the blood to be removed through dialysis utilizing one of a diffusion phenomenon resulting from a concentration gradient and filtration resulting from a pressure gradient,

wherein an angle formed by a centerline of the inner surface of the housing body portion and an inner surface of the end tapered portion is greater than 0° and smaller than an angle defined by $\tan^{-1}\{1/2 \cdot (d_1 - d_4)/L_4\}$ (where, d_1 is the diameter of the hollow fiber membrane bundle at an end face of the resin layer, d_4 is an inner diameter of the body straight portion or minimum diameter portion of the housing body portion, and L_4 is the length (one side) of the end tapered portion which increases in diameter toward the end face of the housing body portion), and

wherein a ratio of the length of the body straight portion to the total length of the end tapered portion is 0.7 to 20, and a ratio of the inner diameter of the end tapered portion at the end face of the housing body portion to the inner diameter of the body straight portion is more than 1 and not more than 3.

2. -12. (Canceled)

13. (Previously Presented) The hollow fiber membrane type fluid treatment device according to claim 1, wherein the tapered portion comprises a first tapered portion located on the body portion side, and a second tapered portion located on the treatment liquid inlet side, and the angle of the first taper angle is smaller than the angle of the second taper angle.

14-16. (Cancelled)

17. (Previously Presented) The hollow fiber membrane type fluid treatment device according to claim 1, having a urea clearance and a vitamin B12 clearance of 191 to 200 ml/min and 135 to 170 ml/min, respectively.

18. (Previously Presented) The hollow fiber membrane type fluid treatment device according to claim 1, comprising baffle plates provided at positions corresponding to the treatment liquid inlet and the treatment liquid outlet of the tubular housing and interspatially from the inner circumference of the tubular housing over the entire inner circumference at a curvature almost along the inner circumference.

19. (Original) The hollow fiber membrane type fluid treatment device according to claim 18, wherein the baffle plate gradually increases in diameter toward the end face of the housing.

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20. (Cancelled)

21. (Cancelled)